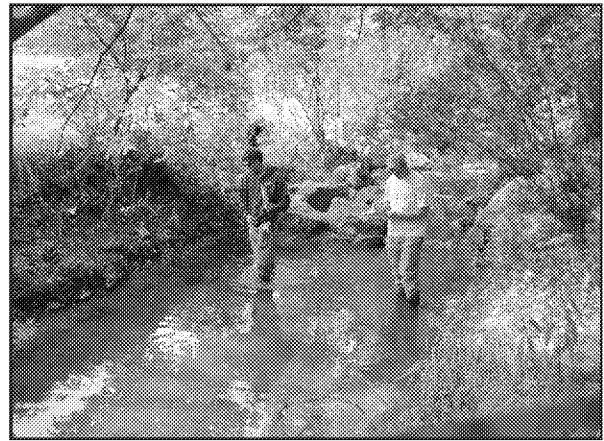


-Anacostia Trash TMDL Monitoring- For Conducting the Stream Visual Count and Pick Surveys



Prepared By:
Metropolitan Washington Council of Governments
Department of Environmental Programs

October, 2017

-DRAFT-

BACKGROUND

The purpose of this document is to provide the Anacostia jurisdictions (e.g., Montgomery and Prince George's Counties, and the District of Columbia) the steps to conduct the instream trash monitoring surveys. Such surveys can provide the instream trash level conditions as well as document trends in specific trash items of interest (e.g., plastic bags, polystyrene, etc.) as the jurisdictions implement both trash removal and pollution prevention measures.

The Metropolitan Washington Council of Governments (COG) have been performing trash monitoring since 1996. The protocols and field survey data sheets herein are revisions of the steps described in both the Anacostia Stream Trash Surveying Methodology and Indexing System (1998) and to stream survey methodology described in the Anacostia Trash TMDL Related Baseline Condition Monitoring: Maryland Protocols (2008).

I. Stream Monitoring

VISUAL COUNT SURVEY

The stream monitoring sites feature representative, 500 foot-long reaches. The protocol includes walking in the wetted perimeter to count trash items within the bankfull width. Therefore, only wadeable sites that can be physically traversed on foot are selected. Only visible trash that is bottle cap size or larger (i.e., approximately one inch diameter or larger) is counted.

In cases where trash has accumulated because of large debris dam, counts for such items as plastic bags, plastic bottles, aluminum cans, etc. are estimated instead of a detailed count. Furthermore, chunks/pieces of Styrofoam are often observed in the stream. Styrofoam count is recorded when the chunks/pieces are, in aggregate, equal to a Styrofoam item. Similar estimates are conducted for glass bottle and brick items.

In-stream baseline trash surveys is performed twice per year targeting the late spring and late summer/early fall (prior to leaf fall) periods. This survey is performed at the same sites as performed under the 2008 baseline monitoring surveys (COG 2008 and AWS 2008). At each site, the total number of observed trash items are recorded and cata-

logued according to 20 types (e.g., plastic bags, plastic bottles, glass, aluminum cans, Styrofoam, food packaging, etc.) on the field survey form (Appendix A - Attachment A). For unique trash items, "best professional judgment" is to be employed to catalog the item or the item is placed in the miscellaneous category. General trash description is provided for the major items in Appendix A - Attachment B.

For safety concerns, at least two (2) surveyors are present. Each count survey begins at the downstream end. Surveyors walk upstream and every trash item within the bankfull width are identified and recorded on the data sheet into one of the 20 trash categories.

In the event of a rainfall producing greater than 0.20 inches or greater within 24 hours, monitoring will be performed within two to three days following the event. It is further recommended that monitoring be performed during clearer, baseflow conditions and that the surveyors wear hip and/or chest waders and polarized sunglasses to reduce surface glare. Photographic documentation of representative conditions present (e.g., general stream channel condition, number of trash 'strainers' and storm drain outfalls present, etc.) is included in the survey.

STEPS

1. Measure the thalweg representative 500 foot-long survey reach. Using a sub-one meter, Trimble GPS unit (or equivalent), mark the start and end points, and record the associated latitude and longitude coordinates. If a pick survey is to be conducted, measure and mark the mid-point to the upper station of the survey reach.

Note: Surveyor's tape, flagging, fluorescent paint or equivalent, should be used to visually mark both the downstream end (0 feet), mid-point (250 feet), and upstream end (500 feet) of the survey reach.

2. Review and determine the bankfull indicators (e.g., bank slope break, bank area devoid of vegetation, bank undercut, discernible trash/debris line, etc.). In some cases, the bankfull height maybe below the top of the high stream bank. Trash outside the top of the bank (i.e., the overbank area or floodplain) is not count-



Multiple Plastic bags wrapped
around a root

ed, but maybe noted.

3. Review the characteristics for trash strainers. Strainers are natural or anthropogenic blockages/structures that catch high number of trash. Such structures include tree falls within the channel, large debris dams, large protruding tree roots and rootwads, instream grade control structures, etc.
4. Conduct the trash survey moving in an upstream direction. For smaller narrow streams (i.e., < approximately 15 feet bankfull width), one surveyor walks straight up the center of the channel counting and calling out the trash item while the other surveyor records. For streams > approximately 15 feet bankfull width, two people will be performing the survey in tandem and the surveyors will divide the channel in equal halves and each will survey and record their half, respectively.
5. Record observed trash items, placing each into one of the 20 trash categories. To facilitate the separation of the “carryout” and “other” plastic bag item, the use of tally counters is strongly recommended.

Note: Truly accurate counting of multiple plastic bags caught in ‘strainers’ is impossible without spending a considerable amount of time unraveling and counting each individual bag. Therefore, a quick visual count (i.e., using best professional judgment), as to the total number of bags present, is recommended.

6. Record the number of strainers.
7. Representative photographic documentation of the survey reach, with a good quality digital/smartphone camera, is strongly recommended. Documentation should include general trash levels, presence and condition of storm drain outfalls, the presence of strainers and other features/conditions present.

PICK SURVEY

To determine the trash accumulation rate, a pick survey is performed for the upper 250 foot long reach at a monitoring site. This survey is conducted on the same day but after the count survey has been completed for that site.

STEPS

1. Beginning at the upper point of the site’s designated 500 foot length, remove every visible trash item within the bankfull width down to the midpoint of the monitoring site reach. Large bulky or heavy items (i.e., tires, bricks, concrete, appliances, etc.) are not collected for the pick surveys (they are recorded for the count surveys);
2. Place the items in a three-millimeter-thick, contractor grade 42 gallon plastic bag;
3. Locate an appropriate working area to sort and weigh trash;
4. Sort every item into the respective trash categories;
5. Record the total wet weight and total number of items for each category and record on a second data sheet.
6. Place all collected trash items into the contractor grade plastic bags and properly dispose (Note: that proper disposal location permission should be coordinated and granted prior to the pick survey).

SURVEY EQUIPMENT

- Chest waders;
- 300 foot long measuring tape;
- Surveyor’s tape, flagging, fluorescent paint or equivalent;
- A hand-held GPS receiver or smart phone with the ArcGIS Collector application will be used to define the start point, midpoint, and endpoints of the 500 foot surveys;
- A 50 bag roll of three millimeter thick, contractor grade 42 gallon plastic bag;
- Rite in the Rain datasheets;

- Polarized sunglasses;
- Tally Counters;
- Bug spray, Technu wash and hand sanitizer;
- Clip boards;
- Digital and/or smartphone camera;
- Two sets of Pesola scales of the 20 kilogram and 1000 gram maximum weight scale (with tare weight feature) and calibration weights;
- Two 5-gallon and two 1-gallon buckets to weigh the total trash items; and
- Cut resistance gloves.

II. Stream Trash Indexing System

In an effort to standardize the reporting of trash levels observed along the Anacostia tributaries, COG developed a simple, relative trash indexing system. This system uses a verbal ranking to characterize the number of trash items observed per 100 feet of stream surveyed. The system ranks the level of trash as follows:

Table 1. Anacostia Trash Reduction Workgroup's Stream Trash Survey Index

Trash Index	
Verbal Ranking	No. Items/100 ft.
None - Very Light	0 - 10.0
Light	10.1 - 25.0
Moderate	25.1 - 50.0
High	>= 50.1

COG developed this indexing system during its pilot trash survey of Sligo Creek watershed. A total of twenty survey reaches within the Sligo Creek watershed, distributed along its mainstem and major tributaries, were surveyed. In addition, reference streams assumed to have low trash levels based on low population densities and low development levels within their drainage areas were selected and surveyed to provide a baseline as to the number of trash items to be expected along clean streams. The surveyed reference stream include: Mary Bird Branch (a tributary of South Fork Quantico Creek in Prince William Forest Park, Prince William County, Virginia) and sections of Upper Paint Branch (Montgomery County, Maryland).

APPENDIX A - ATTACHMENT A

ANACOSTIA WATERSHED TRASH SURVEY – MDE 8 Digit Watershed Code - 02140205

DATE: _____ START TIME: _____
CREW: _____ END TIME: _____

SUBWATERSHED:									
STATION NUMBER:									
STATION NAME:									
STARTING COORD. (DDMMSS):	Lat:	Long:							
END COORD. (DDMMSS):	Lat:	Long:							
SURVEY TYPE (check applicable)									
1. Stream	<input type="checkbox"/>	Length (ft):							
	<input type="checkbox"/>	No. of Trash "Strainers":							
	<input type="checkbox"/>	Riparian Buffer Conditions:							
2. Trash Netting System	<input type="checkbox"/>	Net Number and Total Weight (lbs)							
Total Number of Nets/ Nets Surveyed	<input type="text"/>	1	2	3	4	5	6	7	8
3. Road Right of Way	<input type="checkbox"/>	300' long and 5' wide on either side of curb gutter per side							
4. Stormwater Management Pond	<input type="checkbox"/>								
5. Storm Drain Outfall (Trash Fence)	<input type="checkbox"/>	DA (Acres/mi²)=							
GENERAL LAND USES (check all applicable)									
• Low Density Residential (large lot, single family)									
• Medium Density Residential (small lot, single family, and/or townhouses)									
• High Density Residential (apartments)									
• Commercial									
• Industrial									
• Institutional (libraries, schools, religious)									
• Recreational Area (developed)									
• Forest									
• Agriculture									
GENERAL STATION DESCRIPTION:									
PHOTO NUMBERS:									
TOTAL NO. OF OBSERVED ITEMS:									
TOP THREE ITEMS AND ASSOCIATED SUB-TOTALS:									
TOTAL WEIGHT (OPTIONAL):		(lbs)							

APPENDIX A - ATTACHMENT A

ANACOSTIA WATERSHED TRASH SURVEY (Cont'd)

STATION NO. : _____

Total Weight: _____ (Check if applicable)

DATE : _____

Less Container Weight: _____ (Check if applicable)

	Trash Item	Field Count		Number of Items (Sub-total)	Optional Weight ()
		Carry Out	Other		
1	Elastic Bags				
2	Plastic Bottles				
3	Glass Bottles				
4	Aluminum Cans				
5	Styrofoam (cups, packaging, etc.) 10 peanuts = 1	Expanded Polystyrene	Other		
6	Paper (newspapers, magazines, etc.)				
7	Cardboard				
8	Cloth/Clothing/Carpeting				
9	Food Packaging				
10	Auto :				
	Oil Quart Containers				
	Oil Filters				
	Antifreeze Containers				
	Body Parts: Large >1 ft ²				
	Small <1 ft ²				
11	Car Batteries				
12	Tires (cars, trucks)				
13	Construction Debris :				
	Bricks (>1/2 brick)				
	Concrete				
	Lumber				
	Misc. (e.g. drywall, etc.)				
14	Appliance(s)				
15	Wooden Pallets				
16	Metal (Drums, Cans, Pipes)				
17	Shopping Carts				
18	Toiletries/Drug Containers				
19	Sports Equipment/Toys				
20	Miscellaneous				
TRASH TOTAL					
DEBRIS SUBTOTAL				Total	
TOTAL WEIGHT					

Container Weight =

of Strainers =

APPENDIX A - ATTACHMENT B

TRASH ITEMS/CATEGORIES

1. Plastic Bags: Typical “carryout” items include plastic grocery bags and shopping bags. Typical “other” items include garbage bags, newspaper sleeves, sheet stretch wrap, mulch bags and the shreds or parts of torn bags.
2. Plastic Bottles: Typical items include plastic containers of any size, used to store liquids. Exceptions include auto products containers such as oil quart, antifreeze, car wax containers, etc. They are recorded in a separate category.
3. Glass Bottles: Typical items include glass containers of any size, typically used to store liquids.
4. Aluminum Cans: Typical items include aluminum containers of any size, typically used to store liquids.
5. Styrofoam (Extruded and expanded polystyrene cups, packaging, etc.): Extruded polystyrene foam (other) are typically thermal insulation sheets and expanded polystyrene foam are typically coffee cups, coolers, or cushioning material in packaging made expanded polystyrene beads.
6. Paper: Typical items include newspaper, napkins, receipts, coated paper cups and plates, etc.
7. Cardboard: Typical items include corrugated thick sheets of paper.
8. Clothing/Carpeting: Typical items include shirts, pants, socks, hats, shoes, purses, backpacks, wallets, umbrellas and carpet and pads. Recent “wet-wipe” towelettes are included in this category.
9. Food Wrappers: Typical food items that comes packaged such as potato chip bags, candy wrappers, juice pouches, etc. Recent biodegradable “take-out” containers are included.
10. Auto: Products Containers- Typical items include bottles, cans, tubes, and other containers that held products used in the care and maintenance of an automobile. Items include oil and antifreeze containers, engine fluid bottles, washer fluid bottles, car wax or polish containers, etc. Vehicle body parts - Anything that was once part of an automobile separated out to large (items greater than 1 square foot) and small (items less than 1 square foot).
11. Automotive/Car batteries: Items include small 6 volt to more typical 12 to 24 volt batteries.
12. Automotive/Car: Items include various sized vehicle tires.
13. Construction Debris: Typical items that were used in the construction or deconstruction of something and include bricks, lumber, concrete, drywall, vinyl tile, siding, or roofing material, and tools.
14. Appliances: Typical items include bicycles, strollers, scooters, lawnmowers, furniture, and appliances such as washing machines, refrigerators, radiators, etc.
15. Wooden Pallets: Typical item include whole or part of wooden pallets.
16. Metal (drums, cans, pipes and foil): Typical items include small and large non-aluminum food or drink containers. It also includes aluminum foil and metal drums, posts and pipes.
17. Shopping Carts: Typical item include various metal and plastic shopping carts.
18. Toiletries/Drug Containers: Typical items include personal care products and their packaging and prescription and over-the-counter drug container and packaging and hypodermic syringes.
19. Sport Equipment/Toys: Typical items include all types and sizes of recreational balls and any toy or discernible part of a toy larger than 1 inch.
20. Miscellaneous: Items that do not fit in any other category or are not identifiable.

References

1. Metropolitan Washington Council of Governments. 1998. Anacostia Stream Trash Surveying Methodology and Indexing System. Washington, DC.
2. Metropolitan Washington Council of Governments. 2008. Anacostia Trash TMDL-Related Baseline Condition Monitoring: Maryland Protocols. Washington, DC.
3. Anacostia Watershed Society. 2008. Anacostia Watershed Trash Reduction Plan. Washington, DC.